Appl. No. 09/872,458
Amdt. January 17, 2006
Reply to Office action of November 2, 2005

PATENT

REMARKS

This Amendment is submitted in response to the non-final Office Action of November 2, 2005 (hereinafter "the Office Action"). Claims 1-6 and 27-38 are pending. All pending claims stand rejected under 35 U.S.C. § 103.

All references to the claims, except as noted, will be made with reference to the claim list above beginning on page 2. All references to "the Office Action," except as noted, will be referencing the most recent Office Action dated November 2, 2005. Except as noted or where the referenced document contains line numberings (e.g., a U.S. Patent), any line numbers referenced herein will count every printed line, except the page header, but including section headings. If there is any confusion or questions regarding any aspect of this Amendment, the Examiner is invited to contact the undersigned.

Status

Applicant acknowledges with appreciation withdrawal of rejections set forth in the previous Office Action of June 8, 2005. However, the outstanding Office Action rejects all pending claims based on newly-cited prior art.

Amendment

The claims are not amended. The claim list provided above presents currently pending claims for the convenience of the Examiner.

Claim Rejections under 35 U.S.C. § 103(a)

Claims 1-38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,519,765 to Kawahito et al. (Kawahito) in view of U.S. Patent 5,797,013 issued to Mahadevan et al. (Mahadevan). Applicants respectfully traverse because there was no motivation to combine the references, because the prior art fails to teach or suggest each and ever feature claimed, or because the claims have been previously canceled.

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1.   Some rejected claims are previously canceled.

With regard to claims 7-26, these claims were canceled in Applicants' previous Amendment. Since these claims have been canceled, they are not pending before the Office and therefore should not be rejected. Applicants therefore respectfully request withdrawal of the rejection as it pertains to claims 7-26.

2.   The prior art fails to provide motivation to combine Kawahito and Mahadevan.

For a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references by themselves, or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. MPEP 2143. The Office Action asserts that, "it would have been obvious . . . to combine Kawahito and Mahadevan because, sorting the index expression would enable determining the maximum distance between them and hence make the program more efficient during optimization" (page 3, lines 20-24). Applicants respectfully disagree.

Kawahito discloses various techniques for performing loop iteration splitting to reduce the number of array boundary checks. For example, in column 1, line 63 to column 2 line 24, a technique is described wherein three loops are generated from an original loop, one not to be range-checked, one for checking the lower bound of an array, and one for checking upper bound of an array (col. 1, lines 63-67). As admitted in the Office Action, however, Kawahito does not mention sorting the index expressions by trip counter and offset to determine the loop structure (Office Action, page 3, lines 16-18). However, the Office Action identifies Mahadevan as teaching the sorting feature.

In fact, as mentioned in the Office Action, Mahadevan teaches listing the various indexes in the loops and sorting them to "notice the maximum distance between them" (Mahadevan, col. 9, line 34-35; Office Action page 3, lines 18-20). However, Mahadevan only teaches that it is helpful to know the distance between index expressions to determine a loop unrolling factor. As explained in Mahadevan, the loop unrolling factor may be calculated by adding one to the maximum difference between two index expressions (col. 9, lines 36-37). The unroll factor is the number of times a loop body is repeated in an unrolled loop. Thus, if a particular loop is executed N times, and the unroll factor is four, then the loop body is repeated four times and this unrolled loop is executed N/4 times (col. 2, line 64 to col. 3, line 8).

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Since the technique of Kawahito (iteration splitting) and that of Mahadevan (loop unrolling) are two separate techniques, and because the maximum distance is determined in Mahadevan to determine an optimum loop factor – a concept not relevant or useful to Kawahito – Applicants respectfully submit that there was no motivation in the prior art for a person to sort the index expressions. Stated more specifically, the prior art did not provide motivation to sort index expressions outside the context of loop unrolling.

3.   The prior art fails to teach or suggest determining loop structure based on index expressions sorted by trip counter and offset.

Prima facie obviousness requires that each and every limitation set forth in the claims be taught or suggested by the prior art. MPEP 2143. The independent claims currently set forth that the loop structure created using iteration splitting is determined based on index expressions sorted by trip counter and offset (claim 1, lines 5-6, 12-13; claim 27, lines 5-6; 9; claim 31, lines 10-11; 13-14; and claim 35, lines 6, 8-9).

The Office Action relies on Mahadevan to show sorting index expressions (Office Action, page 3, lines 18-20). However, Mahadevan does not mention sorting index expressions by both trip counter and offset. Furthermore, Mahadevan teaches sorting the index expressions only to determine maximum distance between them, to calculate an optimum loop factor (col. 9, lines 36-38). There is no teaching or suggestion of transforming a loop structure using iteration splitting such that loop structure is based on index expression sorted by trip counter and offset.

Since the prior art fails to teach or suggest sorting index expressions by trip counter and offset, and because the prior art fails to teach or suggest basing a loop structure formed by iteration splitting on sorted index expressions, Applicants respectfully submit that the prior art fails to teach or suggest the presently claimed invention.

For the reasons mentioned above, Applicants respectfully submit that this Application is now in condition for allowance. Examiner is invited to contact the undersigned by telephone at (408) 774-6933 if he has any questions regarding this Amendment or to resolve any remaining issues. If any other fees are due in connection with filing this amendment, the

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Commissioner is also authorized to charge Deposit Account No. 50-0805 (Order No. SUNMP018). A duplicate copy of the transmittal is enclosed for this purpose.

Respectfully submitted,
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